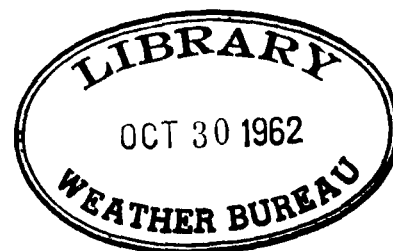


GOVERNMENT OF INDIA  
METEOROLOGICAL DEPARTMENT

# INDIA WEATHER REVIEW, 1957

## Annual Summary



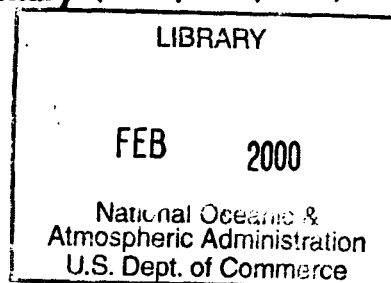
## PART B

## SNOWFALL

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Information Manufacturing Corporation  
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September 14, 1999

# INDIA WEATHER REVIEW, 1957

## ANNUAL SUMMARY

### PART B.

### SNOWFALL

This part contains a summary of the reports of snowfalls in the mountain ranges to the north of India based on (a) records of snowfall observations made at the observatories and (b) reports collected by local officers from the local residents, headmen of villages or from travellers who passed through the region and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in centimetres or tenths of metres. At places provided with raingauges the snow collected in the gauge is melted and measured as rain. This is indicated in the text and the measurements are given in tenths of centimetres. The heights of well known peaks are reported in nearest metres wherever available while the heights of mountain ranges etc. are reported in tens of metres.

#### Cold Weather Period—January and February

#### I—JAMMU AND KASHMIR

##### South Anantnag District

*Srinagar.*—Several snowfalls of light to moderate intensity occurred during the month of January. The heaviest fall 4.8 cms. was on 27th, the total precipitation in the month being 10.3 cms. February experienced few snowfalls. The heaviest fall of 2.8 cms. was on 8th, total precipitation being 5.5 cms. The accumulations at the end of January and February on the surrounding peaks and passes were 2.4 m. and 1.8 m. respectively. The snowfall was above normal for both the months.

*Patni Top (Batote).*—January witnessed snowfalls on thirteen days of which falls on six days were heavy. On one occasion the fall lasted for five days continuously and the snowline descended to 760 metres. This was reported to be the heaviest fall ever recorded during the last twenty years. All the ranges and passes were closed. The snow depth at the station proper at the end of January was 1.5 m. February experienced no snowfalls, but the snow depth at the end of the month was still 18 cms. Banihal Kishtawar and Bhadarweh areas were covered with snow. The falls were much above normal in the month of January.

##### Ladakh District

*Kargil.*—The snowfall during January was 30 cms. while the snow accumulations at the end of the month on peaks were above 3 metres. February had four occasions of snowfall the total fall amounting to 15 cms. In both the months the falls were more than normal. The accumulations at the end of February were about 2½ m.

*Sonamarg.*—January had fourteen days of snowfall with heavy snowfall on three days. The depth of snow varied from 3 cms. to 110 cms. during the month. February experienced

snowfall on eleven days with heavy snowfall on five days. The total snowfalls in January and February were 5.5 and 3.4 metres respectively and were above normal in both the months.

*Dras.*—Snowfall occurred on seventeen days in January and thirteen days in February. Each month experienced two days of heavy snowfall, while it was only slight on the other days. The snow accumulations on the ground at the end of January and February were 1 m. and 1.4 m. respectively. The falls during the period were above normal.

#### II—PUNJAB (I)

##### Chamba District

##### Pangi

*Kilar (Pangi Range).*—Snow fell on eighteen days in January and seven days in February, the total snow on the ground being 147 cms. and 81 cms. respectively. The amounts of water (melted snow) were 10.2 cms. and 6.3 cms. respectively. The accumulation at Sach Pass (Ht. 4291 m.) at the end of January was 9 m. while at the end of February was 10 m. Snowfall was reported to be normal for the period.

##### Churah

*Tissa.*—Twelve snowstorms occurred during the month of January, the depth of snow during each storm varied from 4 cms. to 25 cms. The snowfall of this month was above normal. Snowline descended to 1200 m. February witnessed one snowstorm, the depth of snow which amounted to 1 cm. was below normal. The accumulation on the surrounding peaks was about 6 m. at the end of January and about 4.5 m. at the end of the period.

*Bhawal.*—Snow fell on eleven days in January, the total fall amounting to 3 m. Snow fell once in February, when the snow depth at the station was 28 cms. The accumulations at Padri and Gamgahal passes were 4.6 m. at the end of January, while in February the respective amounts were 1.2 m. and 1.8 m. Snowfall was above normal during the period.

*Tikri.*—About four snowfalls occurred in January varying between 15 cms. to 76 cms. The snowfall of this month was above normal. The total depth of snow at Masrind station being 147 cms. February experienced two snowstorms associated with thunder and lightning. The snowline descended to a height of 1980 m. The depth of snowfall varied between 30 and 75 cms. on each occasion. The accumulations at Drati pass (Ht. 3962 m.) were estimated to be about 7.3 m. at the end of the period.

*Chhatri.*—Snow fell on twelve days in January and once in February, the total falls in January and February being 170 cms. and 2.5 cms respectively.

**Chamba**

*Upper Chamba.*—There were twelve snowshowers in this range. The snowline descended to a height of 1070 m. Snowfall occurred once in February with the snowline descending to 1680 m. Snow accumulations on the nearby peaks were as follows :

Pass	January	February
Balaini . . .	1.8 to 2.1 m.	1.5 m.
Bohar . . .	Do.	1.2 m.
Konkot . . .	Do.	..

Snowfall was above normal in January and normal in February.

*Lower Chamba.*—About five snowstorms occurred in January, the depth of snow accumulation varying from 50 cms. to 120 cms. Snowstorms accompanied with thunder and lightening were witnessed twice in February. No snow occurred below 2000 m. The accumulation of snow on peaks was between 3.7 m. to 5.5 m. In January snowfall was reported to be above normal. The accumulations on the passes in this region were as follows :

Name of pass	Ht. a.s.l. of the pass in metres	Accumulation at the end of (in metres)	
		January	February
Sach Pass .	4420	9.1	7.6
Padhri Pass .	3660	7.6	3.7
Basodhan Pass	2740	5.5	1.8

**Bhattiyat**

*Kalatop (Dalhousi Forest Range).*—The station experienced snowfall on eleven days in January and two days in February. The total depth of snow was 7.4 m. in January and 6.0 m. in February. The individual falls ranged between 8 cms. and 140 cms. The snowfall was normal for the period.

*Trehta.*—Snow fell on twelve days in January. The total snowfall in January was 188 cms. and the snow line descended to an elevation of 910 m. It snowed throughout the month of February on ranges above 2100 m.; on two occasions the snowfall descended to 1680 m.

The snow accumulations of Holi range (1830 m.) was about 0.5 metres and on peaks above 3660 m. it was estimated to be between 6 to 9 metres at the end of January. At the end of February the northeastern and northern aspects of the range were still under heavy snow upto 1830 m.

**Brahmour**

*Brahmour.*—Snow fell on eleven days in January, the total fall in the month amounting to 130 cms. No report for February was received.

**Mahasa District**

*Pandrabis.*—It snowed on ten days in January, the total snowfall at Phancha raingauge station amounting to 128 cms. The snowline descended to an elevation of 1830 m. in January and 2290 m. in February. No snowfall was experienced in February. The accumulation on the Sirikhand peak and Spiti pass was about 2.4 m. in January and continued at the same depth till the end of the period. The snowfall was above average for both the months.

*Kilba-Kailash.*—The following table shows the number of days of snowfall and the corresponding amounts during each month:

Station	No. of days of snowfall		Total snowfall in cms.	
	January	February	January	February
Kilba . . .	7	2	137	6
Sangla . . .	10	6	112	25
Purbani . . .	12	6	130	18

*Chini (Kalpar).*—Snow fell for sixteen days in January and seven days in February the total falls in these months being 183 cms. and 41 cms. respectively. The snowfall was above normal for both the months.

*Rampur.*—Snowstorms occurred on six days in January and two days in February and passed on to the elevations of 1370 m. and 2130 m. in these months respectively. The snow accumulations on the following places were as under :

Name of place	Snow accumulation in cms.	
	January	February
Daran Ghati . . .	90	60
Hatu peak . . .	120	90

*Kumarsain.*—The snowfall descended to the height of 1220 m. in January and 2130 m. in February. The depth of snowfall in ranges of height 1830 m. was about 8 cms. in January and 5 cms. in February while in ranges of height 2740 m. it was about 40 cms. in January and 15 cms. in February. This year the snowfall was above normal.

*Suni.*—Snowfall occurred on seven days in January with the depths of snow varying from 15 cms. to 46 cms. At the end of January, the snow accumulation on the Shali peak (Ht. 2743 m.) was 122 cms. No snowfall occurred in February.

*Lower Paber Range.*—The total amounts of snowfall at the stations Khadralla and Bashla were as given below :

Station	January		February	
	Cms.	No. of days	Cms.	No. of days
Khadralla . . .	264	14	36	5
Bashla . . .	147	9	10	3

The stations experienced normal snowfall in both the months.

*Rohru.*—Snowfall occurred on fourteen days in January and five days in February. It snowed up to an elevation of 1520 m. in January and 1830 m. in February, the depth of snowfall varying from 15 cms. to 213 cms. Snowfall was much above normal for both the months.

*Arki.*—Snow fell for four days in January. At Barcan Dhar (Ht. 2070 m.) the depth of snow was 75 cms., while at Kanaghoo Pass (1646 m.) the depth was 45 cms. Snowstorms were reported throughout the Tehsil during January. The snowfall in the month of January was above normal. During February there was no snowfall.

*Solan.*—Snowfall occurred on two days in January, total fall amounting to 25 cms. The snowline descended up to Karol, Matlul and Barog peaks. No snow fell in February.

The snow accumulation on higher passes was reported as more than normal at the end of January.

**Jubbāl.**—In January during the second and third week, heavy snowfalls occurred and the snowline descended to 1070 m.a.s.l. Below the snowline it was raining. Snowfall on 4 days in nearby stations is as given below :

Station	Height above sea level in metres	Depth of snow in cms.
Chopal . . . . .	2438	213
Dēya . . . . .	2225	168
Sarāni . . . . .	2209	167
Tharaoch . . . . .	2081	107
Manalag . . . . .	2438	168
Jubbāl . . . . .	1891	107
Kanda . . . . .	2195	137
Chhuch Pur . . . . .	3353	229

The accumulations at the end of January on the peaks in the region are given below :

Station	Elevation (m)	Accumulations in cms.
Manalag . . . . .	2438	137
Mandha Ghati . . . . .	2499	152
Jalra . . . . .	3223	182
Chhuch Pur . . . . .	3353	182

The snowfall was above normal during the month.

No report for February was received.

#### Kangra District

**Seraj.**—The following table gives the depths of snow on well known passes and peaks.

Name of peak	Depth of snowfall in cms.	
	January	February
Shrikhand . . . . .	122	61
Chol . . . . .	61	30
Maghan . . . . .	30	46
Dandku . . . . .	46	30
Tikar . . . . .	46	30
Ramgarh . . . . .	61	30
Nohan . . . . .	61	46
Raghupur . . . . .	76	46
Jalori Pass . . . . .	91	30
Sakim . . . . .	107	30
Lambri . . . . .	107	30
Gargaraan . . . . .	107	61
Shepakaru . . . . .	122	61
Mach . . . . .	107	91
Tirth . . . . .	122	76

**Kulu.**—The following table shows the snowfall on the well known peaks of the Tehsil in January and the accumulations at the end of the month.

Name of peak	Snowfall during the month in cms.	Accumulations at the end of January in cms.
Hamta . . . . .	366	793
Rohtang . . . . .	305	731
Barsai . . . . .	244	610
Bhojdhar . . . . .	213	549
Chandar Khani . . . . .	183	457
Lohriachhri . . . . .	152	396
Sari . . . . .	122	244
Bhubhu . . . . .	91	183
Bashtari . . . . .	61	122
Mujhag . . . . .	61	91

Snowfall was reported to be more than normal during the month.

No report has been received for February.

#### Mandi District

**Mandi Forest Division.**—The following table gives the depths of snowfall at the well known passes and peaks :

Name of peak or pass	Elevation (approx.) in metres	Depth of snowfall in cms.	
		January	February
Shikari . . . . .	3080	152	91
Tungasi . . . . .	2740	122	3
Raigarh . . . . .	2900	122	46
Kashian . . . . .	2440	122	61
Kandhi . . . . .	2440	152	31
Bhubhu . . . . .	2740	183	5

Snowfall was above normal for the period.

**Suket.**—Of the three rain gauge stations Jhungi, Karsoj and Suket only Jhungi recorded snowfalls on 6 days amounting to 86 cms. in January, while no snow was experienced in February. The accumulations at the highest peaks in this region were about 3 m. in January and 2.4 m. in February. In January snowfall was above normal, while in February snow accumulation was above normal.

#### Sirmur District

**Sirmur.**—Snow fell for five days in January and the snowline descended to a height of 1830 m. Snow accumulations on some of the ranges in the region were as follows :

Range	Height in metres	Accumulations at the end of January in m.
Chur Dhar . . . . .	3200-3660	2 2½
Banali Dhar . . . . .	1800 to 2000	1
Bathoo Dhar . . . . .	1800-2000	1
Khera Dhar . . . . .	1800-2000	1

Snowfall was above normal in the month of January.

Report for February was not received.

III—UTTAR PRADESH

Tehri Garhwal District

In January snow fell on three days. On 9th and 10th the snowfall descended up to Tehri proper (700 m.). The depths of snow at the peaks of Surkanda and Nagtiba were between 20 cms. to 120 cms. The third snow fall occurred on 30th when about 10 cms. of snow was estimated at a height 1220 m. The snowfall of January was quite heavy and exceptional; there were no such falls in the district since 1945.

No report for February was received.

Garhwal District

There were seventeen snowfalls in January and twelve in February. Snow accumulations of 3 cms. to 5 cms. were observed at a height of 1220 m. in January and at heights between 2130 m. to 3050 m. in February. The snowfall was above normal for both the months.

Almora District

During January, Malla Danpur had eighteen falls while Malla Darma had five falls. In addition there were two widespread falls all over the district during this month. The accumulations at the end of January and February were as follows :

Locality	January	February
Falls		
Malla Danpur . . . . .	4 to 10	0.6 to 1.5
Malla Darma . . . . .	4	1.5
Accumulations		
Kautela Peak . . . . .	4.0	0.6
Kautela Valley . . . . .	4.6	..
Kafni Peak . . . . .	4.6	0.9
Kafni Valley . . . . .	5.2	..
Bankatia Peak . . . . .	9.1	1.2
Bankatia Valley . . . . .	9.7	..
Pindar Peak . . . . .	9.1	1.2
Pindar Valley . . . . .	9.5	..
Nanda Khat Peak . . . . .	9.1	1.5
Nanda Khat Valley . . . . .	9.7	..
Sundardhunga Peak . . . . .	8.2	1.2
Sundardhunga Valley . . . . .	8.8	..

The snowfall was above normal in January and below normal in February.

Nainital District

Mukteswar.—Light continuous snow fell on nine days in January, the depth of snow varying from 5 cms. to 38 cms. The total amount of snow melted into water, amounted to 131 cms. The station experienced snowstorm accompanied with lightening and thunder extending to the surrounding high peaks viz. Naini Tal, Ramgarh, Almora etc. The snowfall of January was very much above normal and reported to be the heaviest of the past 12 years.

No report for February was received.

IV—ASSAM

Naga Hills

Kohima.—Snowfall occurred in the hill districts during the latter part of January and the first week of February. The depths of snowfall on the peaks were reported to be between 5 cms. and 15 cms. The snowline was 3000 m. a. s. l.

Hot Weather Period—March to May

I—JAMMU AND KASHMIR

North Baramullah District

Gulmarg.—Reports for March and April are not available. May witnessed heavy snowfalls accompanied by hails. The snow accumulations on peaks and passes were quite heavy and above normal.

South Anantnag District

Srinagar.—Several snowfalls of light to moderate intensity occurred in the months of March, April and May. The total precipitations at the end of March, April and May were 14.3 cms. 22.3 cms. and 14.7 cms. respectively. The snow accumulation on the surrounding mountains at the end of the period was about 61 cms. The heaviest snowfall of 4.7 cms. was recorded on 24th May. Snowfall was above normal for the period.

Patni Top.—Snowfall in the form of sleet occurred on the surrounding mountains for two days in March and April. No snow fell in May. The snowline descended to a height of 2130 m. in March and April while in May it was at a height of 2740 m. Eastern Pirpanjal and Kishtwar ranges were covered with snow at the end of the period. Snowfall was above normal in April.

Ladakh District

Kargil.—Report for March is not available. It snowed on two days in April when the total snowfall on the ground was 20 cms. The snow accumulation on peaks ranged between 3.1 m. to 3.7 m. No snow fell in May but the snow accumulation was still between 2.4 m. to 2.7 m. Snowfall was reported to be above average.

Sonemarg.—Slight to heavy snowfall occurred in March with the depth of snow varying from 3 cms. to 137 cms. In April it snowed on 11 days, the snowfall being heavy on six days. The accumulation of snow on the ground was 2.7 m. In May snow fell on three days, the total fall amounting to 6.4 m. On passes like Zojilla the depth of snow was more than usual. Snowfall was above normal during the period.

Dras.—It snowed on six days in March, ten days in April and eight days in May. The snow accumulation on the ground was 244 cms. at the end of March, 91 cms. to the end of April and 5 cms. at the end of May. Snowfall was reported as above normal in March and May.

II—PUNJAB (I)

Chamba District

Pangi

Kilar (Pangi Range).—It snowed on nine days in March and seven days in April. The total snowfall amounted to 94 cms. in March and 61 cms. in April. No snow fell in May. At Sach pass (Ht. 4413 m.) the snow accumulation was 10.7 m. in March, 7.3 m in April and 6 m. in May. Snowfall was estimated to be normal for the period.

Churah

Tissa.—Six snowfalls were experienced in March above 1830 m. height. Report for April is not available. In May there were 4 showers of snowfall with the snow depth varying from 5 cms. to 10 cms. The snowline descended to a height of 2900 m. Snowfall was above normal both in March and May.

**Bhandal.**—No snow fell during the period. In March the snow accumulations at Padri pass and Gamgual pass were 1.5 m. and 1.8 m. respectively.

**Tikri.**—Snowstorms accompanied by lightning, thunder and wind occurred three times in March, but were restricted to a height of 1710 m. The depth of snowfall at each time was estimated between 30 to 61 cms. April experienced five snowfalls above 2300 m. while May recorded four snowfalls above 2400 m. In lower regions storms of hailstone followed by rainshowers occurred both in April and May. In May four snowfalls occurred. At Drati pass (Ht. 3353 m) the accumulations at the end of the months March, April and May were 6.1, 4.9 and 3.7 metres respectively. The snowfall was above normal during the period.

#### Chamba

**Lower Chamba.**—No snow fell in March. Reports for April and May are not available. The snow accumulation at Chhabam peak was 1.5 metres.

**Chamba.**—Snowstorms of mild nature occurred on seven days in March, three days in April and five days in May. The snowline descended to a height of 2350 m. a. s. l. in March and 3050 m. a. s. l. in April and May. The depths of snow accumulations on peaks and passes in the region were as follows:

Name of the pass	Ht. a. s. l. in metres	Snow accumulation (cm) at the end of		
		March	April	May
Basodhan	2743	61	15	15
Padri	3658	183	61	122
Sach	4420	457	152	213

The snowfall was above normal for the period.

#### Bhattyat

**Kalato.**—Snowfall reports for March and May are not available. April witnessed one hailstorm, the precipitation amounting to about 8 cms. Snowfall was normal for the month.

**Trehta.**—Weather remained stormy and snowy throughout March and April above 2130 m. for three days at Holi (1829 m. a. s. l.) the total fall amounting to about 18 cms. At a height above 2134 m. it remained snowing both in March and April. The snow accumulation at Sinchi pass (ht. 3658 m.) was between 120 to 150 cms. No report for May is available. Snowfall was above normal for both March and April.

#### Mahasu District

**Pandrabis.**—Snowfall was noticed almost every alternate day both in March and April, at an elevation of 2440 m. and above. At Spiti pass and Sirikhand peak the snow accumulation was 2.4 m. at the end of March and 2.7 m. at the end of April. Report for May is not available. No snowfall was observed at Phancha during March or April. Snowfall was estimated to be above normal in March and April.

**Kilba-Kailash.**—In March it snowed on six days at Sangla and eight days at Purbani, the total falls at these stations amounting to about 27 cms. and 19 cms. respectively. The raingauge station at Kilba did not record any snowfall in March. Reports for April and May are not available.

**Chini (Kalpar).**—Snowfall occurred on six days in March, once in April and twice in May, the total falls in these months amounting to about 30 cms., 8 cms. and 36 cms. respectively.

**Rampur.**—Snowstorms were recorded on seven days in March and four days in April. May recorded only one snowstorm. The snowdepths on Daranghati and Hatu peaks varied from 5 cms. to 15 cms. during the period. The snow accumulations on these peaks were as follows:—

Name of the peak	Snow accumulation in cms. at the end of		
	March	April	May
Daranghati . . .	15	15	..
Hatu . . . . .	91	76	46

The snowline descended to a height of 2130 m. in March and about 2450 m. in April and May.

**Kumarsain.**—In March snowfall occurred at a height of 1830 m. and above, while in April snowfall of mild nature occurred on high mountains. The depth of snow at a height 1830 m. was about 3 cms. while at a height 2740 m. it was about 30 cms. in March. Snowfall was above normal in March while it was of an ordinary nature in April. May did not receive any snowfall.

**Suni.**—No snow fell in the months of March and April. Report for May is not available.

**Parala.**—No snow fell in March. Reports for April and May are not available.

**Lower Pabar range.**—The number of snowy days and the total amounts of snowfall in March and April at the station Khadralla and Bashla were as given below:

Name of the station	No. of snowy days		Total snowfall in cms.	
	March	April	March	April
Khadralla . . .	13	3	86	25
Bashla . . . . .	2	Nil	5	Nil

Report for May is not available.

**Rohru.**—Snowfall occurred for fourteen days in March and twelve days in April at an elevation of 2440 m. and the depth of snowfall varied from 5 to 8 cms. Report for May is not available. The accumulation at Chanshil Ghati at the end of April was estimated to be about 4 metres. The snowfall for the months March and April was above normal.

**Arki.**—No snow fell during the period.

#### Kangra District

**Seraj.**—The following table gives the depths of snow on some well known peaks.

Name of the peak	Depth of snow in cms.		
	March	April	May
Sirikhand . . .	60	75	15
Chol . . . . .	30	15	..
Maghan . . . .	15	8	..
Dundku . . . .	30	8	..
Tikar . . . . .	30	8	..
Ramgarh . . . .	15	8	..
Nohun . . . . .	15	15	..
Raghopur . . . .	45	45	..

Name of the peak	Depth of snow in cms.		
	March	April	May
Jalori Pass . .	30	30	..
Sakirn . . .	30	45	..
Lambri . . .	30	30	..
Gargarasan . .	45	60	15
Shepakaru . .	45	45	15
Mach . . .	75	75	30
Tirth . . .	75	75	30

*Kulu.*—The following table gives the amounts of snowfall and snow accumulations on the nearby peaks.

Name of the peak	Total snowfall in m.	Snow accumulation in m. at the end of	
	March	March	April
Hamta	3.7	6.4	5.5
Rohtang . .	3.7	6.1	5.2
Barsai . . .	3.1	4.6	3.7
Bhojdhar . .	3.1	4.3	3.1
Chandarkhani .	2.4	3.3	2.4
Lohriachhari .	2.1	3.1	1.8
Sari . . .	2.1	2.1	3.1
Bhubhu . . .	1.8	1.5	3.1
Bashtari . .	1.5	0.9	..
Mujhag . . .	1.2	0.6	1.2

The snowfall was above normal for the month.

### Mandi District

*Mandi Forest Division.*—The depth of snowfall on some prominent peaks was as given below :

Name of the peak	Height in metres	Depth of snowfall in cms.	
		March	April
Shikari . . .	3350	61	..
Kandhi . . .	2440	5	3
Bhubu . . .	2740	8	3

No accumulation was experienced in the month of May. Snowfall was reported to be above average of previous years.

*Suket Forest Division.*—No snow fell during the period. At the end of March the amounts of snow accumulations at the peaks of Shikari and Tajat Khanna were 61 cms. and 30 cms. respectively.

### III—UTTAR PRADESH

*Tehri Garhwal District.*—There was no snowfall during the period.

*Garhwal District.*—There were nineteen, twentyone and fifteen snowfalls in the months of March, April and May respectively. The depths of snowfall varied from 3 cms. to 8 cms.

at a height of 2000 m. to 3050m. in March, 1 to 3 cms at a height of 2130 m. to 2350 m. in April and 1 to 3 cms. at a height of 2900 to 3600 m. in May. The depth of snowfall was below normal for the period.

*Almora District.*—The amount of snowfall at some of the localities and accumulation on some of the peaks were as follows :—

Locality	March	April	May
	m.	m.	m.
<i>Falls</i>			
Malla Darma	2.4	0.6 to 1.8	Up to 2.4
Malla Danpur .	0.9 to 1.8	0.3 to 1.5	0.3 to 0.9
<i>Accumulation</i>			
Kautela peak .	0.9	0.3	0.3
Kafni peak . .	1.2	0.5	0.5
Bankatia peak .	1.5	0.9	0.9
Pindar peak . .	1.5	1.2	0.9
Nanda Khat peak .	1.8	1.5	0.8
Sundardhunga peak	1.5	1.2	0.6

Malla Darma recorded five snowfalls and Malla Danpur recorded only one in April while in May about ten and seven snowfalls were recorded at these locations. The snowfall was above normal for the period.

### Nainital District

*Mukteshwar.*—It snowed for one day in March, the depth of snow amounting to 22 cms. The total amount of water (melted snow) was 2.2 cms. The snowstorm extended to the surrounding high peaks viz., Nainital, Ramgarh, etc. The snowfall for March was above normal. Reports are not available for April and May.

### IV—ASSAM

#### Nowgong District

*Nowgong.*—No snow fell in March or April. Report for May has not been received.

#### Kamrup District

*Barpeta.*—There was no snowfall.

### Southwest Monsoon Period—June September June-July

### I—JAMMU AND KASHMIR

#### North Baramulla District

*Gulmarg.*—In June ten light snowfalls were observed on the tops of Afarwat and Handibal mountains and the total precipitation was 8 cms. July recorded only one snowfall on the mountains and the total precipitation for the month was 7 cms. The snowfall and the snow accumulation for the period were reported to be above normal.

#### South Anantnag District

*Srinagar.*—No snowfall occurred during the period. Snow accumulation of nearly 30 cms. was observed on the high peaks and passes of the surrounding mountains, which was melting away by the end of the period.



**Patni Top (Batote).**—No snow fell during the period. The snowline descended to 3660m and 3350m in the months of June and July respectively. Snow accumulation was visible only on eastern Pirpanjal range.

#### Ladakh District

**Kargil.**—No snow fell during the period. The snow accumulation on the peaks of the surrounding mountains was between 150 to 180 cms.

**Sanemarg.**—Snowfall was observed only on high peaks like Zojilla. By the end of the period the Zojilla pass was covered by snow avalanches with accumulation about 9 metres.

**Dras.**—No snow fell in June and July neither was there any snow on the ground. Snowfall was below normal.

**Leh.**—Light snowfall was observed at heights 4600m. to 6100m. Snow covering of about 5m. was observed on peaks by the end of June. No snow fell in July. Snow accumulation at a height 6100m. was about 2m by the end of July.

### II—PUNJAB (I)

#### Chamba District

##### Pangi

**Kilar (Pangi Range).**—No snow fell during the period. The accumulation at Sach pass (Ht. 4413m.) was 3.7m. in June and 2.4m. in July.

##### Churah

**Bhandal.**—No snow fell during the period.

**Tikri.**—It snowed twice in June, the snowline descending to 3660m. The depths of snow accumulations at Drati pass and Moharu pass were 183 cms. and 152 cms. respectively. Report for July was not received.

##### Chamba

**Chamba.**—The snow accumulation on the passes in this region viz. Kugti, Chobia, Kalichho, Jalsu Kowarsi, Bohar and Baliani in Bharmaur, Trehta and Upper Chamba by the end of July was between 91 to 122 cms. and was reported to be abnormal. There was a snowfall of depth 30 cms in July on these passes, which came down to height 3350m. The snowfall was reported to be quite heavy and above normal.

#### Mahasu District.

**Kilba-Kailash.**—No snow fell in June and July. The snow accumulation on nearby peaks and mountains was heavy at the end of the period.

**Rampur.**—No snow fell during the period.

#### Kangra District

**Kulu.**—No snow fell during the period. The accumulations on Rohtang and Hamta peaks were 150 cms and 180 cms respectively.

#### Mandi District

**Mandi Forest Division.**—No snow fell during the period. No snow accumulation was observed on any of the nearby peaks.

**Suket Forest Division.**—No snow fell during the period. There was no snow accumulation left on any peak of this division.

### III—UTTAR PRADESH

**Tehri Garhwal District.**—No snow fell.

**Garhwal District.**—Snow fell twice in June. July experienced fifteen snowfalls with depth of snow varying from 3 cms to 5 cms. on high peaks (Ht. 5200m to 5800m.).

**Almora District.**—The following table gives the depths of falls during and accumulations at the end of June and July.

Locality	June (cms.)	July (cms.)
<b>Falls</b>		
Malla Danpur	15 to 60	4 to 5
Malla Darma	60 to 310	152
<b>Accumulations</b>		
Kautela peak	15	..
Kafini peak	25	..
Bankatia peak	60	5
Pindar peak	60	4
Nanda Khat peak	70	5
Sunderdhunga peak	60	4

There were eight snowfalls in Malla Danpur and fourteen snowfalls in Malla Darma in June. Malla Darma witnessed equal number of snowfalls in July also. Snowfall was above normal during the period.

#### August-September

### I—JAMMU AND KASHMIR

#### North Baramulla District

**Gulmarg.**—No snow fell in August while in September seven light snowfalls were observed on Handibal and Apharwat mountain ranges. The snow accumulation on the peaks of the surrounding mountains was present till the end of the period. Snowfall was above normal.

#### South Anantnag District

**Srinagar.**—No snowfalls occurred at the station proper. Light snowfalls were observed at high altitudes, which melted away soon.

**Patni Top (Batote).**—No snow fell.

#### Ladakh District

**Dras.**—Snowfall occurred once in August. No snow fell in September.

### II—PUNJAB (I)

#### Chamba District

##### Pangi

**Kilar (Pangi Range).**—No snow fell during the period at the station proper. Snowfall occurred at an elevation of 3660m. In August the depth of snow accumulation at Sach pass (Ht. 4413 m) was 2.4 m, which melted away by the end of September.

##### Churah

**Tissa.**—No snow fell.

**Bhandal.**—No snow fell.

**Tikri.**—Snowfall occurred at an elevation of 3050 m. thrice in August and twice in September. At certain high altitudes hailstorms followed by rain were observed. The depth of each fall varied from 30 to 90 cms. The snow accumulation on some of the peaks and passes was as follows.

Name of the pass	Depth of snow accumulation in cms.	
	August	September
Drati pass	91	91
Chaurasi peak	91	91
Mehlu pass	61	45

**Chamba**

*Lower Chamba.*—No snow fell.

**Mahasu District**

*Rampur.*—No snow fell.

**Mandi District**

*Mandi Forest Division.*—No snow fell.

*Suket Forest Division.*—No snow fell.

**III—UTTAR PRADESH**

**Tehri Garhwal District**

No snow fell.

**Almora District**

There were about 12 snow falls in Patti, Ma'lla Darma during September. The following table gives the depths of snowfalls and the accumulation at the end of August and September.

Locality	Depth of snow accumulation in cms.	
	August	September
<i>Falls</i>		
Malla Darma	90	185
Malla Danpur	3	8 to 10
Byans	..	150 to 210
<i>Accumulation</i>		
Nandakhat	3	10
Nanda Devi	3	10
Bankatia	3	10
Tindar peak	..	9
Sunderdhunga	..	8
Lipuleg	..	150
Limpiale	..	210

*Post-monsoon Period—October-December*

**I—JAMMU AND KASHMIR**

**South Anantnag District**

*Srinagar.*—Several light to moderate snowfalls were observed on the surrounding mountains in the months of October and November. The heaviest falls occurred on 23rd October and 25th November, the corresponding precipitations amounting to 3.2 cms. and 4.0 cms. The respective total precipitations were 17.1 cms. and 10.2 cms. Report for December was not received. The snowfall for these months was above normal.

*Patni Top (Batote).*—Snowfall occurred on four days in October and two days each in November and December. The snowline descended to a height of 500 m. in October. Banihal range, Ensin Dhar tops and Eastern Pirpanjal were covered in snow during the period, while the snowfall received at the station proper had melted off by the end of the period. Snowfall was said to be normal in October.

**Ladakh District**

*Sonemarg.*—It snowed on six days in October and seven days each in November and December. The snow accumulation on the ground was about 1 to 2 metres and on passes like Zojilla, it was more than normal. The snowfall was above normal in October and November and normal in December.

*Dras.*—Slight to heavy snowfalls were observed on six days in October, nine days in November and five days in December. The heaviest snowfall occurred on 15th October with snowdepth about 1.5 metres. The snow accumulation on the ground was reported to be 1.5 m. during the period.

**II—PUNJAB (I)**

**Chamba District**

*Pangi*

*Kilar (Pangi range).*—Snowfall occurred thrice in October. The total amount of snowfall in October was 42 cms. The snow accumulation at Sach pass was about 3 m. at the end of October. No reports are available for November and December.

*Churah*

*Tissa.*—October and November witnessed two snowfalls and the snowline descended to an elevation of 2130 m. December experienced 4 snowstorms with depth varying from 10 cms to 20 cms on nearby peaks. The snow accumulation at the end of December was about 3 to 4½ m. on peaks Sach Jote, Mangli and Nagui Jote. The snowfall was above normal.

*Bhandal.*—Snowstorms were observed three times in October and November but were restricted to higher levels. In December snowfalls did not descend below 1700 m. On the well known passes Ganguhl and Padri the snow accumulation at the end of November was about 1 m. and about 3 to 4 m. at the end of the period. The snowfall as well as the accumulation on peaks were estimated to be below the average for the period.

*Tikri.*—Report is not available for October. Snowfall was observed 3 times each in November and December above 2150 m. The snowdepth on high peaks varied from 10 cms. to 300 cms. At Drati pass, Mehlu pass and Chaurasi peak the accumulations at the end of November and December were 2 to 3 metres. Snowfall was above average for November and below average for December.

*Brahmour.*—Snowstorms occurred on four days in October, two days in November and three days in December. The depth of snow was 10 cms. in October, 45 cms. in November and 75 cms. in December. The snow accumulations on some of the passes and peaks in the period were as follows :

Name	Depths of snow accumulations in metres		
	Oct.	Nov.	Dec.
Kalichho pass	2.4	3.1	3.1
Chobia pass	2.4	3.1	3.1
Kugti pass	2.4	3.1	3.1
Manimahesh peak	2.7	3.1	3.7

**Mahasu District**

*Pandrabis.*—It snowed on five days in December, the total fall recorded at Phancha rainguage amounting to 35 cms. The snowline descended to 1520 m. The depth of snow accumulation on Spiti pass was about 2 m. The snowfall for the month was below normal. No reports are available for October and November.

**Kilba-Kailash.**—The total snowfalls at the following stations were as under :

Name of the station	Total snowfall in cms.	
	October	November
Kilba . . . . .	2.5	Nil
Sangla . . . . .	20	2.5
Purbani . . . . .	43	Nil

No report for December was received.

**Chini (Kalpar).**—Snow fell on two days each in October and November and five days in December. The total amounts of snowfall in these months were 66 cms., 5 cms and 127 cms. respectively. Snowfall was above normal in October and November.

**Rampur.**—Snowstorms occurred on three days in October and four days in December. The snowline descended to an elevation of 2300 m. in October and 2000 m. in December. The depth of snowfall in October was 16 cms on both Daranghati and Hatu peak, while in December the respective depths were 60 cms and 90 cms. The snow accumulations at the end of the period on Daranghati and Hatu peak were about 25 cms and 45 cms respectively.

**Suni.**—Snow fell on four days in December and the snowline descended to height of 2130 m. The depth of snowfall on Shali peak was 20 cms and the snow accumulation at the end of the period was 30 cms. No reports are available for October and November.

**Arki.**—No snow fell in December. Reports for October and November were not received.

**Solan.**—No snow fell in December. Reports for October and November were not received.

**Jubbal.**—No reports were received for October and November. Snowfall occurred on 4 days in December. The snow depths on some important places of the division were as under:

Name of the station	Height of the station in metres a.s.l.	Total depth of snowfall in cms.
Sarain . . . . .	2209	70
Mandah Ghati . . . . .	2499	90
Deya . . . . .	2225	60
Bohg . . . . .	2134	40
Tharaoch . . . . .	2081	40
Chopal . . . . .	2438	60
Chur peak . . . . .	3658	140
Talra . . . . .	3223	110

#### Kangra District

**Kulu.**—Snowfall occurred a number of times during the period. The snow accumulation on some peaks of the region at the end of period was as under :

Name of the peak	Snow accumulation in metres
Hamta . . . . .	5.5
Rohtang . . . . .	4.9

Name of the peak	Snow accumulation in metres
Barsai . . . . .	4.3
Bhojdhar . . . . .	3.7
Chandarkhani . . . . .	3.3
Lohariachhari . . . . .	2.4
Bhubhu . . . . .	0.9
Bashtari . . . . .	0.6
Mujhag . . . . .	0.6
Sari . . . . .	1.5

The snowfall was above normal for the period.

#### Mandi District

**Mandi Forest Division.**—The depths of snowfall on the well known passes and peaks in the region were as under:

Name of the pass or peak	Elevation of the station in m.	Snow accumulation in cms.		
		Oct.	Nov.	Dec.
Shikari . . . . .	3350	15	15	91
Tungasi . . . . .	2740	15	15	76
Magrugali . . . . .	—	15	—	—
Raigarh . . . . .	2900	—	15	61
Kashain . . . . .	2440	—	15	76
Kandhi . . . . .	2440	—	3	30
Bhubhu . . . . .	2740	—	5	45

Snowfall was above normal for October and November and below normal in December.

**Suket Forest Division.**—No snow was recorded at any of the raingauge stations Suket, Zhungi and Karsoj during the period. But snowfall occurred at an elevation of 1830 m. in December and the depth of snow at higher peaks was 90 cms. Snowfall for December was more than normal.

### III—UTTAR PRADESH

#### Tehri Garhwal District

No snow fell in October and November. It snowed on four days (9 to 12) in December on the peaks of Nagatiba, Surkanda, Kedarkantha and Badrapooch, the depth of snow amounting to 20 cms. The snowline descended to an elevation of 1830 m. Snowfall was above normal for the month of December.

#### Garhwal District

There were three snowfalls in October, one in November and three in December on high peaks. The snowline descended to an elevation 3050 m in October, 2130 m in November and 1830 m in December. The depth of snowfall varied from 3 cms to 150 cms. Snowfall was below normal in October and November and normal in December.

#### Almora District

The following table gives the depth of falls during and accumulations at the end of each month.

Locality	October	November	December
	cms.	cms.	cms.
<i>Falls</i>			
Malla Darma . . .	90	90	120
Malla Danpur . . .	90 to 105	90	90 to 210
Gorifat . . .	60	90	90 to 180
Malla Johar . . .	..	..	120
<i>Accumulations</i>			
Bankatia peak . . .	90	90	120
Bankatia valley . . .	..	75	180
Pindar peak . . .	90	75	120
Pindar valley . . .	..	60	180
Sunderdhunga peak . . .	90	75	120
Sunderdhunga valley . . .	..	60	180
Nubbedhura peak . . .	90	90	240
Nandadhar . . .	105	..	..
Chheplea . . .	60	180	..
Panchchali . . .	60	180	300
Nandadevi peak . . .	..	90	150
Nandadevi valley . . .	..	75	240
Kifini peak . . .	15	90	90
Kautela peak . . .	10	90	90
Dharti valley . . .	..	150	..
Gaut Duhura . . .	..	..	430

Nainital District

Mukteshwar.— Moderate snowfall occurred on 11th December, the total depth amounting to 4 cms. The snowfall extended to the high peaks of Nainital and Ramgarh. Snowfall was light and below normal. No reports were received for October and November.

SUMMARY

Cold Weather Period, January and February

Snowfall was above normal in Jammu and Kashmir, the Punjab (I) and Uttar Pradesh.

Hot Weather Period, March to May

Snowfall was above normal in Jammu and Kashmir and the Punjab (I) and normal in Uttar Pradesh.

Monsoon Period, June and July

Snowfall was generally normal in Jammu and Kashmir, the Punjab (I) and the Uttar Pradesh.

Monsoon Period, August and September

Snowfall was probably normal in Jammu and Kashmir, the Punjab (I) and the Uttar Pradesh.

Post-Monsoon Period, October to December

Snowfall was slightly above normal in Jammu and Kashmir and the Punjab (I) and slightly below normal in Uttar Pradesh.

N. B. — It is not possible to adopt a single classification of season which will be satisfactory for the whole of India. The classification adopted in this publication is however, considered as the most satisfactory one and the least open to objection especially from the point of view of rainfall.